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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/626,266

07/23/2003

Jeffrey J. Spiegelman

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05/16/2007

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EXAMINER

LANGEL, WAYNE A

ART UNIT

PAPER NUMBER

1754

MAIL DATE

DELIVERY MODE

05/16/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/626,266

Applicant(s)

SPIEGELMAN ET AL.

Examiner

Wayne Langel

Art Unit

1754

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 May 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>2-18-05</u> | 6) <input type="checkbox"/> Other: ____ |

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Becher et al in view of Schulz et al, further in view of Gary. Becher et al discloses in Paragraph [0027] that ammonia synthesis requires high purity hydrogen and nitrogen to react at high temperatures and pressures in the presence of a catalyst. The differences between the process disclosed by Becher et al, and that recited in claims 1-7 and 16-21, are that Becher et al do not disclose that the hydrogen should be produced by feeding deionized water to a hydrogen generator, or that the nitrogen should be purified by passing it through a nitrogen purifier. Schulz et al disclose at col. 6, lines 37-46 and col. 8, lines 1-8 that magnesium reacts with pure water to obtain hydrogen. Gary teaches at col. 1, lines 18-46 that ultra-pure nitrogen may be formed by passing it through a purifier. It would be obvious from Schulz et al to form the hydrogen necessary for the process of Becher et al by feeding deionized water to a hydrogen generator, since Schulz et al teach that the water should be pure and it would be obvious to employ deionized water as such pure water. It would be further obvious from Gary to pass the nitrogen necessary for the process of Becher et al through a purifier, since Becher et al teach that the nitrogen must be pure and Gary discloses at col. 1, lines 18-46 that nitrogen may be purified by passing it through a purifier. It would also be obvious to pass the hydrogen formed according to the process of Schulz et al through a purifier

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before using it as a reactant in the process of Becher et al, since Becher et al require that the hydrogen fed to the ammonia synthesis be pure and one of ordinary skill in the art would appreciate that the hydrogen formed according to the process Schulz et al, to the extent that it contains impurities, could be purified by passing it through a hydrogen purifier. Regarding claims 2-5, it would be obvious to form the pure water necessary for the process of Schulz et al by degassing in a membrane reactor and employing nitrogen stripping or vacuum stripping, since these steps are conventional in and of themselves for the production of pure water.

Claims 8-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Becher et al in view of Schulz et al, further in view of Gary as applied to claim 1 above, and further in view of either Alvarez, Jr. et al or Vergani et al. It would be further obvious from either Alvarez, Jr. et al or Vergani et al to purify the ammonia formed in the process of Becher et al by passing it through a purifier containing a metal oxide, since Alvarez, Jr. et al and Vergani et al both disclose that ammonia can be so purified. (See col. 9, lines 26-38 of Vergani et al, and the paragraph bridging columns 10 and 11 of Alvarez, Jr. et al.)

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Becher et al in view of Schulz et al, further in view of Gary as applied to claim 1 above, and further in view of Louise et al. It would be further obvious from Louise et al to purify the nitrogen necessary for the process of Becher et al by passing it through a nitrogen purifier comprising a nickel catalyst, since Louise et al disclose such a process at col. 1, lines 38-61.

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The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 10 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "high surface area" renders the scope of the claims vague and indefinite, since "high" is a relative term.

This application apparently discloses allowable subject matter (i.e., regarding the subject matter of claim 14).

Kindig et al and da Rosa are made of record for disclosing methods of forming ammonia using pure reactants.

JP 3-161451 is made of record for disclosing a hydrogen generator using pure water as a reactant.

The following is a statement of reasons for the indication of allowable subject matter: Becher et al discloses in Paragraph [0027] that ammonia synthesis requires high purity hydrogen and nitrogen to react at high temperatures and pressures in the presence of a catalyst. Schulz et al disclose at col. 6, lines 37-46 and col. 8, lines 1-8 that magnesium reacts with pure water to obtain hydrogen. Gary teaches at col. 1, lines 18-46 that ultra-pure nitrogen may be formed by passing it through a purifier. It would be obvious from Schulz et al to form the hydrogen necessary for the process of Becher et al by feeding deionized water to a hydrogen generator, since Schulz et al teach that the water should be pure and it would be obvious to employ deionized water as such pure water. It would be further obvious from Gary to pass the nitrogen necessary for the

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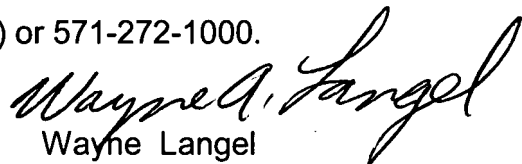
process of Becher et al through a purifier, since Becher et al teach that the nitrogen must be pure and Gary discloses at col. 1, lines 18-46 that nitrogen may be purified by passing it through a purifier. It would also be obvious to pass the hydrogen formed according to the process of Schulz et al through a purifier before using it as a reactant in the process of Becher et al, since Becher et al require that the hydrogen fed to the ammonia synthesis be pure and one of ordinary skill in the art would appreciate that the hydrogen formed according to the process Schulz et al, to the extent that it contains impurities, could be purified by passing it through a hydrogen purifier. However there is no teaching, disclosure or suggestion in the prior art to purify the hydrogen by passing it through a high surface area metal oxide as specified in claim 14. Nor would there be any motivation from the prior art to do so.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wayne Langel whose telephone number is 571-272-1353. The examiner can normally be reached on Monday through Friday, 8 am - 3:30 pm Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, reading "Wayne Langel". The signature is fluid and cursive, with the first name "Wayne" and last name "Langel" clearly distinguishable.

Wayne Langel
Primary Examiner
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